

from it we learn what Münsterberg, Ribot, Jastrow, Prince, Janet and Bernard Hart mean by the subconscious. That such a work serves a useful purpose may be gathered from the fact that, as the master of the symposium states in his introduction, there are six recognised meanings of "the subconscious":—

(1) That portion of consciousness which for the moment is outside the field of attention.

(2) Split-off or dissociated ideas, such as automatic writing.

(3) A subliminal, secondary, subconscious "self" constituted and elaborated from such dissociated ideas.

(4) A combination of dissociated and forgotten ideas.

(5) The subliminal reservoir of consciousness from which ideas are drawn into phenomenal consciousness.

(6) Certain neural processes unaccompanied by any mentation whatsoever.

Most of the writers take the view that subconscious phenomena are physiological and not psychological processes, the underlying reason in all being that they are not memories, ideas or anything else of which mentation is composed.

Janet, of course, limits the subconscious to such abnormal states as are encountered in hysteria and psychasthenia, and Bernard Hart considers that the marginal elements of phenomenal consciousness (the *subconscious* of Stout), dissociated portions of phenomenal consciousness (the *co-conscious* of Morton Prince and the *subconscious* of Janet) and the non-phenomenal conceptual *unconscious* of Freud all form part of the material of psychology and not of physiology. It need scarcely be said that a symposium by such writers is above criticism; they criticise each other.

Mikroskopische Untersuchungen über die Übereinstimmung in der Struktur und dem Wachstume der Tiere und Pflanzen. By Dr. T. Schwann. Edited by F. Hunseler. Pp. 242+iv Taf. (Leipzig: W. Engelmann, 1910.) Price 3.60 marks.

At a time when the accumulation of the facts of animal and plant structure threatened to prevent a clear conception of their true value, this famous memoir by a distinguished pupil of Johannes Müller converted histology into a rational branch of science. Schwann, who effected this profound change, based his method on development. He pointed out that "there is a common principle of development for all the elementary parts of the organism," and in so doing founded (with Schleiden) the cell-theory upon which modern physiology and pathology are based. The cellular nature of animals and plants had already been demonstrated, but there was no general hypothesis to "colligate" the facts. This Schwann supplied. He not only confirmed facts of cellular structure, but, in a refreshingly broad way, and moving with the ease of genius amongst a multiplicity of data that would have bewildered a lesser mind, he brought forward the evidence for the origin of the tissues and enunciated clearly his views on the nature of life.

To Schwann the organism is a beehive, as Huxley said in his famous essay on this very treatise. Its activities are the expression of the myriads of cell-changes, each independent of all the rest. To Schwann, and almost against his better judgment, the organism was, indeed, the product of its cells, and its cell the result of the crystallising of a "cytoblastema." Though in some ways we have outgrown this essay, its influence will probably always be felt, and when histology, as to-day, has become incapable of large views from the overburdening load of descriptive data, we realise the need of another Schwann; let us be

thankful for the physiologist who by his developmental hypothesis put the subject-matter into a definite problem and offered a feasible answer.

Determinación de la Latitud por la Observación de Distancias Cenitales de la Estrella Polar. By C. Puente. Pp. 227. (Madrid: Observatorio Astronómico de Madrid, 1910.)

THIS is a monograph on the method of determining the latitude of a place from observations of the zenith distances of Polaris, at a known time. There is nothing new in this method, which proceeds on the ordinary lines of developing the latitude in a series of ascending powers of the polar distance, but the author has put the discussion out with great clearness and considered very carefully the terms that must be taken into account, according to the degree of approximation needed, as well as the most suitable formulæ for use when Polaris is near the upper or lower culmination. The methods of observing by means of the theodolites, the instrumental adjustments, and the precautions necessary to be taken to ensure accuracy are detailed with very great care, the instructions being evidently intended for those who have had little practice. Numerous examples are worked out by different methods, and we have the ordinary curiosity of a latitude determined to the hundredth of a second when the microscopes read only to half seconds, and the time is observed no nearer than a second. Some of the results are so accordant that the ordinary observer must despair of attaining a similar accuracy. The greater portion of the book contains auxiliary tables for accelerating the reduction. Some of these have been extended from Albrecht's "Formeln und Hilfstafeln für geographische Ortsbestimmungen," and are available only within the limits of the Iberian Peninsula.—The more important of the tables include values of $\frac{2 \sin^2 \frac{1}{2} t}{\sin 1''}$, $\log \frac{2 \sin^4 \frac{1}{2} t}{\sin 1''}$, also $\frac{\cos \phi \cos \delta}{\sin (\delta \pm \phi)}$ where t , ϕ , and δ have the ordinary signification.

Calculus Made Easy. Being a very simplest Introduction to those beautiful Methods of Reckoning which are generally called by the terrifying names of the Differential Calculus and the Integral Calculus. By F.R.S. Pp. viii+178. (London: Macmillan and Co., Ltd., 1910.) Price 2s. net.

THE author of this little book writes as if it were the first of its kind, and in encouraging his readers he continually jeers at the professional mathematician in what might be regarded as reckless nursery language. In spite of such faults, we have no doubt that the book will be useful to schoolboys who need the ideas of the calculus in their study of physical science. The young engineer or the clever schoolboy will think it illogical and slipshod to leave $(dx)^2$ out of consideration, as it is inconsiderable in comparison with the other terms of $(x+dx)^2$, and he will say that there is only a pretence in the proof of the differentiation of x^n ; he will probably look upon the introduction of the expansion of $(1+1/n)^n$ when n is indefinitely great, as not quite playing the nursery game.

Einführung in die Biologie. Ein Hilfsbuch für höhere Lehranstalten und für den Selbstunterricht. By Dr. W. Schoenichen. Pp. viii+215. (Leipzig: Quelle and Meyer, 1910.) Price 2.60 marks.

It is difficult to understand to whom this little book is intended to appeal. It might almost be described as a scrap-book of illustrations, borrowed mostly from other text-books, and strung together with a minimum of letterpress. The subject-matter is treated from the point of view of physiology rather than that of comparative anatomy, but there is a short section dealing with cells and tissues, and some extremely

inadequate descriptions of certain animal types. The geological history of the vegetable kingdom is dealt with in about half a page of text, but an entire page is devoted to "Lamarckismus und Darwinismus." This being so, it seems a piece of reckless extravagance to have devoted several pages of the section on movement to organisms which do not move. The appetite of the German public for small doses of extremely condensed elementary biology seems to be insatiable. We should like to know to what extent information conveyed in this way is capable of assimilation. It seems as if a considerable amount of previous biological training would be necessary, even for the intelligent reading of such a book as this. It may perhaps be of some use in supplying new points of view to those to whom the actual facts are already more or less familiar.

Heaton's Annual. The Commercial Handbook of Canada and Boards of Trade Register, 1911. Edited by E. Heaton and J. B. Robinson. Pp. 540. (Toronto: Heaton's Agency; London: Simpkin, Marshall, Hamilton, Kent and Co., Ltd.) Price 5s.

THE information about Canada which a business-man requires is here arranged in logical sequence. All matter under the head of general information is official, having been collected from the latest Blue Books. The Boards of Trade Register contains descriptions of towns, with notes of opportunities offering for manufacturers, investors, and individuals. Altogether this is a useful work of reference.

Flowers of the Field. By the late Rev. C. A. Johns. Thirty-third edition, entirely revised by G. S. Boulger. Pp. 611+64 coloured plates. (London: Society for Promoting Christian Knowledge, 1911.) Price 7s. 6d.

NOTHING need be said about the interest and usefulness of a book which has reached its thirty-third edition. In its revised form this popular manual will probably enter on a new lease of life, for it would be difficult to find a more convenient volume for the student of field botany.

The British Isles: Geographical Diagrams and Land Forms, with Questions, Statistics, and Tables. By H. J. Snape. Pp. 64. (London: A. and C. Black, 1911.) Price 1s. 6d.

Most teachers expect to find in the text-book of geography they place in the hands of their pupils maps, pictures, and statistics of the kind Mr. Snape has brought together here. In schools where it is difficult to use a magic-lantern, the pictures especially should prove useful. The book is likely to save teachers time and trouble.

Familiar Wild Flowers. Figured and described by F. Edward Hulme. Pp. xviii+184. (London: Cassell and Co., Ltd., 1910.) Price 3s. 6d.

THIS series of volumes—of which the present is the ninth—with their striking coloured plates, are already widely known and deservedly popular. It is easy with the aid of these books to decide the species and genus of common wild flowers, and to discover the part they may have taken in folk-lore and other literature. We understand this is the concluding volume of the series.

Junior Experimental Science. By W. M. Hooton. Pp. lviii+277. (London: W. B. Clive, 1910.) Price 2s. 6d.

THIS is the second edition of a book which on its first appearance was reviewed in *NATURE* for May 16, 1907 (vol. xxvi., p. 51). There do not appear to be any important changes in the volume.

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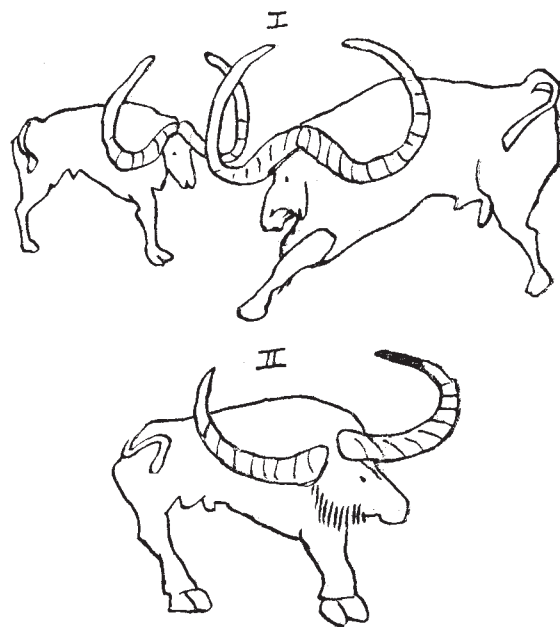
LETTERS TO THE EDITOR.

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The Extinct Buffalo of Algeria as Drawn by Prehistoric Man.

ONE of my objects in making a tour recently into south-western Algeria and the adjoining region of the Moroccan Sahara was to see the engravings on the rock surfaces, which have lately attracted much attention amongst French men of science, especially those who are more or less connected with the University of Algiers. Quite a number of the sites of these remarkable rock drawings (such as Tiout and Zenaga) can be reached by the long railway which the State has constructed from Oran on the north to Figuig and the Wed Gir in the extreme south of Morocco.

These pictures on the rocks have been mainly studied and illustrated by M. Gautier (*Mission Sahara: Le*



Prehistoric drawings of *Bos (bubalus) antiquus* in South-western Algeria.
I. On rock-surface at Ennfous in the Adfou district, east of Géryville.
II. At Ksar al Ahmar, near Géryville.

Sahara Algérien), and by M. G. B. Flamand, through the Lyons Society of Anthropology. M. Flamand's great work on the subject, however, is not yet completed for publication.

The chief features of interest in these prehistoric drawings will certainly be to zoologists the huge buffalo with enormous horns, which is perhaps the animal most frequently illustrated. I have copied a number of these either from the stones or the photographs of the stones, which may be seen at the University of Algiers or in the Algiers Archaeological Museum, and give two of them here.

Of course, the great interest of these drawings is that they come as a valuable supplement to the palaeontological discoveries made in the Quaternary and late Tertiary deposits of Algeria. The principal person connected with the discovery and illustration of the vanished fauna of Algeria was the late Prof. A. Pomel, whose works were mostly published between 1893 and 1908. Amongst the discoveries of himself or his predecessors were the remains of a gigantic buffalo—*Bos (bubalus) antiquus*—a creature